The topic of energy has been overrun with so many false premises and so much junk "science" as to make any intelligent discussion nearly impossible - and nowhere is the effect of this onslaught more apparent than in the field of nuclear power.

A complete listing of all the objections voiced against nuclear energy over the decades would fill this page; their refutations can - and have - filled books. The critical points, however, can be summarized as follows: risk of explosion and/or core meltdown; radioactive waste disposal; and economic infeasibility.

(1) Risk of explosion and/or core meltdown. The U-235 used in nuclear power plants is only enriched to a factor of 3.5 percent, while weapons-grade U-235 requires an enrichment rate of over 90 percent. A nuclear power plant's atomic core, therefore, has about as much chance of exploding as does your typical steak dinner. (The explosion at Chernobyl in 1986 was a steam explosion, the results of which could never have happened in the West: The Soviets did not bother with the "luxury" of containment buildings.)

While the threat of core meltdown is physically possible, the reactor vessel - typically a nine-inch-thick steel encasement weighing 450 tons, with three completely independent Emergency Core Cooling Systems (ECCS) piped into it - would contain all but the most runaway of core meltdowns. And, in such an event, there remains the existence of the containment building itself (made out of four-foot-thick reinforced concrete and designed to withstand the impact of a jet airliner at landing speeds).

Such potential meltdowns, should they ever occur, are processes that take hours to complete, even assuming a complete failure of all ECCS and other defense-in-depth safety systems. The chances of 1,000 people being killed in such an accident are the same as the chances of 1,000 people being killed by a meteor strike - one in a billion per year ("Rasmussen Report," 1975). How much time is available to spend on preventive measures when an oil-refinery tank explodes? How many defenses-in-depth does a bursting dam have? Absolutely zero in both cases.

(2) Radioactive waste disposal. Due to the fact that nuclear power concentrates much more energy per unit volume than any other form of power generation, the wastes created by a nuclear power plant are a minute fraction of those created by an equivalent coal-fired plant: 60 truckloads of waste for nuclear versus 36,500 truckloads for coal (still misleading, inasmuch as nearly all of that 60 is lead shielding). Indeed, it is precisely this much higher ratio of energy gained to waste produced that makes nuclear power so attractive. Nuclear wastes, in addition, are completely contained; fully 10 percent of the byproducts of coal-fired power generation, however, are spewed into our atmosphere where, in the words of Petr Beckmann, it proceeds to "dispose of itself in our lungs" ("The Health Hazards of Not Going Nuclear," 1976).

Sealed in fireproof, waterproof, and earthquake-proof glass and stored thousands of feet down in geologically safe locations such as salt formations, these wastes pose no hazard. Not so with coal wastes: Besides being thousands of times more massive in volume, these ashes are simply dumped into unmonitored surface landfills where their poisonous chemicals (selenium, mercury, vanadium, radium, thorium, and benzopyrene, to name a few) are free to leach their way into our groundwater.

(3) Economic Infeasibility. While it is true that a nuclear power plant requires a higher capital investment than a corresponding conventional-energy power plant (due to the costs of the defense-in-depth systems that all other plant technologies lack), it is also true that the operating costs of nuclear energy are smaller than that of coal, gas, or oil. In the decade of 1995 to 2005, for instance, the ratios were (in cents per kilowatt/hour): nuclear, 1.72; coal, 2.21; gas, 7.51; and oil, 8.09 (World Nuclear Association, 2008). Over the typical 40-year lifespan of a nuclear power plant, those lower operating costs more than make up for initial capital investments, making nuclear power the most economically feasible method of large-scale energy-production.

The facts, when examined, are quite clear: Nuclear power is the safest, cleanest, and most efficient form of energy ever invented by man, and its potential for providing safe and massive amounts of electrical power for the United States - and for ending our reliance on the whims of Arab dictators - are positively enormous. To fail to promote such a viable alternative, in the face of our energy problems, is worse than unscientific: It is rapidly bordering upon the suicidal.

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